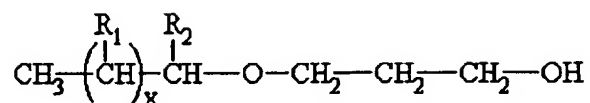


WE CLAIM:

1. A branched alcohol composition comprising a branched ether primary alcohol represented by the formula:

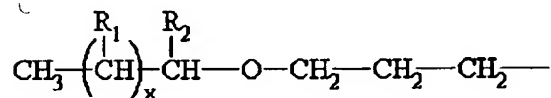


wherein R_1 represents hydrogen or a hydrocarbyl radical having from 1 to 3 carbon atoms, R_2 represents a hydrocarbyl radical having from 1 to 7 carbon atoms, x is a number ranging from 0 to 16, wherein the total number of carbon atoms in the alcohol ranges from 9 to 24.

2. The branched alcohol composition of claim 1 wherein R_2 is a hydrocarbyl radical having 1 carbon atom.
3. The branched alcohol composition of claim 2 wherein R_1 is hydrogen.
4. The branched alcohol composition of claim 1 wherein x is a number ranging from 3 to 13.

5. An alkyl ether sulfate composition comprising an alkyl ether sulfate represented by the formula:

XOSO_3M , wherein M is hydrogen or a cation, and X is represented by the formula



wherein R_1 represents hydrogen or a hydrocarbyl radical having from 1 to 3 carbon atoms, R_2 represents a hydrocarbyl radical having from 1 to 7 carbon atoms, x is a number ranging from 0 to 16, wherein the total number of carbon atoms in the alkyl ether sulfate ranges from 9 to 24.

6. The alkyl ether sulfate composition of claim 5 wherein M is hydrogen.

7. The alkyl ether sulfate composition of claim 5 wherein M is a cation effective to provide a water soluble alkyl ether sulfate composition.

8. The alkyl ether sulfate composition of claim 7 wherein M is selected from the group consisting of ammonium, alkanolammonium, monovalent metal cations, and polyvalent metal cations.

9. The alkyl ether sulfate composition of claim 5 wherein R_2 is a hydrocarbyl radical having 1 carbon atom.

10. The alkyl ether sulfate composition of claim 9 wherein R_1 is hydrogen.

11. The alkyl ether sulfate composition of claim 5 wherein x is a number ranging from 3 to 13.

12. The alkyl ether sulfate composition of claim 6 wherein R_2 is a hydrocarbyl radical having 1 carbon atom.

13. The alkyl ether sulfate composition of claim 12 wherein R_1 is hydrogen.

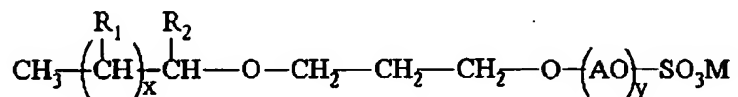
14. The alkyl ether sulfate composition of claim 6 wherein x is a number ranging from 3 to 13.

15. The alkyl ether sulfate composition of claim 7 wherein R₂ is a hydrocarbyl radical having 1 carbon atom.

16. The alkyl ether sulfate composition of claim 15 wherein R₁ is hydrogen.

17. The alkyl ether sulfate composition of claim 7 wherein x is a number ranging from 3 to 13.

18. An alcohol alkoxysulfate composition comprising an alcohol alkoxy sulfate represented by the formula:



wherein R₁ represents hydrogen or a hydrocarbyl radical having from 1 to 3 carbon atoms, R₂ represents a hydrocarbyl radical having from 1 to 7 carbon atoms, x is a number ranging from 0 to 16, A is an alkylene radical having carbon number in the range of 2 to 4, y is a number ranging from 1 to 9, wherein the total number of carbon atoms in the alcohol alkoxysulfate excluding A ranges from 9 to 24, and M is hydrogen or a cation.

19. The alcohol alkoxysulfate composition of claim 18 wherein A is an alkylene radical having carbon number in the range of 2 to 3.

20. The alcohol alkoxysulfate composition of claim 19 wherein A is an alkylene radical having carbon number of 2.

21. The alkyl ether sulfate composition of claim 18 wherein M is hydrogen.

22. The alkyl ether sulfate composition of claim 18 wherein M is a cation effective to provide a water soluble alkyl ether sulfate composition.

23. The alkyl ether sulfate composition of claim 22 wherein M is selected from the group consisting of ammonium, alkanolammonium, monovalent metal cations, and polyvalent metal cations.

24. The alkyl ether sulfate composition of claim 18 wherein R_2 is a hydrocarbyl radical having 1 carbon atom.

25. The alkyl ether sulfate composition of claim 24 wherein R_1 is hydrogen.

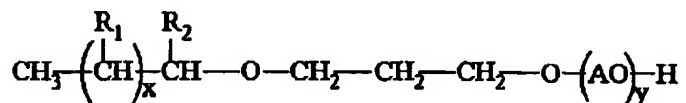
26. The alkyl ether sulfate composition of claim 18 wherein x is a number ranging from 3 to 13.

27. The alkyl ether sulfate composition of claim 20 wherein R_2 is a hydrocarbyl radical having 1 carbon atom.

28. The alkyl ether sulfate composition of claim 27 wherein R_1 is hydrogen.

29. The alkyl ether sulfate composition of claim 20 wherein x is a number ranging from 3 to 13.

30. A branched alkanol alkoxylate composition comprising an alkanol alkoxylate represented by the formula:



wherein R₁ represents hydrogen or a hydrocarbyl radical having from 1 to 3 carbon atoms, R₂ represents a hydrocarbyl radical having from 1 to 7 carbon atoms, x is a number ranging from 0 to 16, A is an alkylene radical having carbon number in the range of 2 to 4, y is a number ranging from 1 to 9, wherein the total number of carbon atoms in the alkanol alkoxylate excluding A ranges from 9 to 24.

31. The branched alkanol alkoxylate composition of claim 30 wherein A is an alkylene radical having carbon number in the range of 2 to 3.

32. The branched alkanol alkoxylate composition of claim 31 wherein A is an alkylene radical having carbon number of 2.

33. The branched alkanol alkoxylate composition of claim 30 wherein R₂ is a hydrocarbyl radical having 1 carbon atom.

34. The branched alkanol alkoxylate composition of claim 33 wherein R₁ is hydrogen.

35. The branched alkanol alkoxylate composition of claim 30 wherein x is a number ranging from 3 to 13.

36. The branched alkanol alkoxylate composition of claim 32 wherein R_2 is a hydrocarbyl radical having 1 carbon atom.

37. The branched alkanol alkoxylate composition of claim 36 wherein R_1 is hydrogen.

38. The branched alkanol alkoxylate composition of claim 32 wherein x is a number ranging from 3 to 13.

39. A detergent composition comprising the alkyl ether sulfate composition of claim 5.

40. A detergent composition comprising the alkyl ether sulfate composition of claim 6.

41. A detergent composition comprising the alkyl ether sulfate composition of claim 7.

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⁴²
42. A detergent composition comprising the alkyl ether sulfate composition of claim 9.

⁴³
43. A detergent composition comprising the alkyl ether sulfate composition of claim 11.

⁴⁴
44. A detergent composition comprising the alcohol ethoxysulfate composition of claim 18.

⁴⁵
45. A detergent composition comprising the alcohol ethoxysulfate composition of claim 20.

⁴⁶
46. A detergent composition comprising the alcohol ethoxysulfate composition of claim 22.

⁴⁷
45. A detergent composition comprising the alcohol
ethoxysulfate composition of claim 24.

⁴⁸
46. A detergent composition comprising the alcohol
ethoxysulfate composition of claim 26.

⁴⁹
47. A detergent composition comprising the alkanol
alkoxylate composition of claim 30.

⁵⁰
48. A detergent composition comprising the alkanol
alkoxylate composition of claim 32.

⁵¹
49. A detergent composition comprising the alkanol
alkoxylate composition of claim 33.

⁵²
50. A process to produce a branched alcohol composition
comprising:

contacting an olefin having an average carbon number in
the range of 3 to 18 with 1,3-propane diol in the
presence of a catalyst effective to react the olefin with
the diol under conditions effective to produce the
branched alcohol composition.

⁵³
51. The process of claim 50 wherein the catalyst is an
acid catalyst.

⁵⁴
52. The process of claim 51 wherein the average carbon
number of the olefin is in the range of 6 to 18.

⁵⁵
53. The process of claim 51 wherein the diol and olefin
is contacted at a temperature within the range of from 50
°C to 250°C.

56

~~54~~. A process to produce a branched alkyl ether sulfate composition comprising:

- a) contacting an olefin having an average carbon number in the range of 3 to 18 with 1,3-propane diol in the presence of a catalyst effective to react the olefin with the diol thereby producing a branched alcohol composition; and
- b) contacting the branched alcohol composition with a sulfating agent under conditions effective to produce a branched alkyl ether sulfate composition.